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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/587,147	07/24/2006	Ryosuke Nishida	2006_1143A	4981

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EXAMINER	
CORDRAY, DENNIS R	

ART UNIT	PAPER NUMBER
1791	

NOTIFICATION DATE	DELIVERY MODE
05/21/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/587,147	NISHIDA ET AL.	
	Examiner	Art Unit	
	DENNIS CORDRAY	1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 April 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 and 4-12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 and 4-12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 2/24/2010 has been entered.

Response to Arguments

Applicant's amendments and arguments filed 2/24/2010 have failed to overcome the outstanding rejections over the cited prior art.

Regarding the rejection of Claim 11 under 35 U.S.C. 112, 1st paragraph, applicant argues that paragraph 47 of the Specification discloses paper being impregnated. However, paragraph 47 recites "said aqueous liquid is impregnated with paper comprising inorganic fiber and pulp-shaped fiber previously manufactured by a common paper manufacturing method..." and continues to recite several impregnation methods. The language of the Specification fails to recite that the paper is impregnated as now claimed. Instead, the language supports the previously used claim language that was previously rejected as being indefinite. The rejection is maintained.

Regarding the rejections over cited prior art, applicant argues that Lorah et al does not teach the negative influence of cation exchange or how to prevent cation exchange. Applicant further argues that the Nishida and Tanaka et al references fail to teach that ion exchange of metal ions existing in water with the acidic group contained in the organic fine particles leads to a decrease in absorptive and desorptive properties of the paper.

Lorah et al was only used in an evidenciary capacity to teach that polymers containing acid groups are known to exchange cations readily. A teaching of the negative effects or means of preventing such exchange was not necessary.

Nishida et al '265 teaches that the carboxyl group of a potassuim type expresses a high moisture absorbing property and that the object of the invention (absorbing-desorbing polymer) is best obtained when all carboxyl groups in the polymer are changed to a potassium type (col 3, line 65 to col 4, line 2; col 4, lines 26-30). The teachings of Nishida et al '265 along with the knowledge that polymers containing acid groups readily exchange cations (Lorah et al) provide sufficient motive to one of ordinary skill in the art to optimize the moisture absorbing properties of the paper by using in the manufacture of the paper water having no non-potassium cations or at least as few non-potassium cations or as possible so that the maximum number of carboxyl groups in the polymer are potassium type.

The rejections over the cited prior art are maintained, but have been modified to address the amended claims.

Claim Rejections - 35 USC § 112

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim 11 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim 11 as amended recites that paper is impregnated with aqueous liquid in which organic fine particles are dispersed or emulsified. Previously, the claim recited that aqueous liquid in which organic fine particles are dispersed or emulsified is impregnated with paper. The instant Specification fully supports the previous claim language (see paragraphs 10, 18, 27 and 58 and original Claims 3 and 11) but fails to support the current language. In examples, such as described in paragraph 86, paper is dipped into an emulsion of organic particles, but there is no disclosure of impregnation of the paper with the particles. While dipping can result in impregnation, it can also result in only coating a paper. The claim as amended thus presents new matter not found in the application as filed.

Claim Rejections - 35 USC § 103

Claims 1 and 4-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Belding et al (US 5791153) in view of Nishida (US 6429265) as evidenced by Lorah et al (US 2002/0055581).

Claims 1, 4-6 and 8-11: Belding et al discloses heat energy and moisture exchange or adsorbent media for use in air-conditioning and ventilating systems. The media comprises layers of absorbent paper having a desiccant incorporated within during fabrication of the paper (thus the paper is impregnated with the desiccant) and/or coated on the formed paper. The desiccant can be any material capable of adsorbing moisture from an air stream and desorbing the moisture in a counter flowing air stream (Abs; col 2, lines 47-58; col 4, lines 64-67; col 5, lines 26-35 and 61-67; col 6, lines 1-9). In some embodiments, the absorbent paper is formed by a standard papermaking process comprising wet-laying the desiccant, inorganic fibers and fibrillated organic fibers (fibrillated acrylic fibers are preferred organic fibers) (col 7, lines 23-31, 39-45 and 53-55; col 8, lines 6-9 and 52-55). Wood pulp is also disclosed as a fiber source (col 9, line 1). Preparation of an aqueous slurry of the desiccant, inorganic fibers and fibrillated organic fibers is an inherent part of the wet-laying process. Thermally adhesive fibers are not required.

Belding et al does not disclose the claimed organic particles or the concentration of cations in the water used to make the paper or the coating. Belding et al also does not disclose the moisture absorbing rate, swelling rate and thermal shrinking rate of the paper.

Nishida '265 discloses particles of crosslinked acrylonitrile polymer (reads on fine particles having a crosslinking structure) capable of absorbing and releasing a high amount of moisture (removing moisture from air is discussed in the background section), the particles comprising potassium salt type carboxyl groups in an amount of 1.0-8.0 mmol/g. In some embodiments, the crosslinking of acrylonitrile groups is introduced by hydrazine and the acid salt groups are formed by hydrolysis of remaining nitrile groups by alkali metal salts. The metals used can include Li, Na, K, Mg and Ca, although K is essential and gives the best result when all carboxyl groups are changed to potassium type (Abs; col 1, lines 5-14; col 2, lines 15-45; col 3, lines 23-32 and 65-67; col 4, lines 1, 2 and 26-45; col 6, lines 14-18, 29-53 and 65-67; col 7, lines 1-3). In other embodiments, the polymer is copolymerized with a crosslinking monomer such as divinylbenzene that reacts with a carboxyl group (col 5, line 53 to col 6, line 7).

Nishida '265 discloses making a paper by adding the polymer particles to a dispersion of pulp and synthetic fiber and manufacturing paper using a conventional paper machine. Alternatively, a slurry of polymer particles is applied to a paper (col 8, lines 9-31).

Nishida '265 discloses that potassium is the best performing of the carboxylic acid salts and the object of the invention (absorbing-desorbing polymer) is best obtained when all carboxyl groups in the polymer are changed to a potassium type (col 3, line 65 to col 4, line 2; col 4, lines 26-30).

Polymers containing acid groups are well known to exchange cations readily (for evidence, see Lorah et al, p 8, right column, lines 3-6).

The art of Belding et al, Nishida '265 and the instant invention is analogous as pertaining to moisture absorbing and desorbing compositions and paper comprising the compositions. It would have been obvious to one of ordinary skill in the art to use the claimed crosslinked acrylate particles as the desiccant in the adsorbent media of Belding et al in view of Nishida '265 as a functionally equivalent material having been disclosed for the purpose. The teachings of Nishida et al '265 along with the knowledge that polymers containing acid groups readily exchange cations (Lorah et al) provide sufficient motive to one of ordinary skill in the art to optimize the moisture absorbing properties of the paper by using in the manufacture of the paper water having no non-potassium cations or at least as few non-potassium cations or as possible, including the claimed amount, so that the maximum number of carboxyl groups in the polymer are potassium type. It would also have been obvious to obtain the claimed moisture absorbing rate, swelling rate and thermal shrinking rate in the paper as the structure of the paper so made is substantially the same as the claimed paper.

Claims 7 and 12: Belding et al discloses that the paper comprises an amount of desiccant from 5 to 85% by weight, the remainder comprising fibrous material (col 8, lines 64-67). Belding et al further discloses synthetic organic fibers can include polyethylene, polypropylene, polyester and polyamide fibers (col 7, lines 39-45), which are thermally adhesive fibers. Belding et al also discloses that the amount of fibrillated fibers and non-fibrillated inorganic and organic fibers can be adjusted to suit the particular need (col 7, lines 32-35). Thus, the fiber mix is a result effective variable and, absent a showing of unobvious results commensurate in scope with the claims, the

claimed amounts of fibers would have been determined by one of ordinary skill in the art by routine experimentation.

Claims 1, 4 and 6-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Belding et al (US 5791153) in view of Tanaka et al (US 5691421) and further in view of Nishida ('265) and as evidenced by Lorah et al.

The disclosure and deficiencies of Belding et al are used as above.

Tanaka et al discloses particles of crosslinked acrylonitrile polymer capable of absorbing and releasing a large amount of moisture (removing moisture from air is discussed in the background section), the particles comprising salt type carboxyl groups in an amount of 1 mmol/g (Abs; col 1, lines 1-15 and 41-60). In some embodiments, the crosslinking of acrylonitrile groups is introduced by hydrazine and the acid salt groups are formed by hydrolysis of remaining nitrile groups by alkali metal salts. The metals used include Li, Na, K, Mg and Ca (col 1, line 65 to col 2, line 65).

Tanaka et al discloses a moisture absorption of 17 to 48% at 20 °C/65% RH (col 4, lines 10-20, Example 1, Table 1; col 6, lines 44 and 45). The particles can be added to any material and are used in any field where moisture absorption and desorption are required (col 7, line 20 to col 8, line 4).

Tanaka et al does not disclose the claimed concentration of cations in the water used to make the paper or the coating. Tanaka et al also does not disclose the claimed swelling rate and thermal shrinking rate of the paper.

The disclosure of Nishida ('265) and evidence of Lorah et al are used as above.

The art of Belding et al, Tanaka et al, Nishida ('265) and the instant invention is analogous as pertaining to moisture absorbing and desorbing compositions and substrates comprising the compositions. It would have been obvious to one of ordinary skill in the art to use the claimed crosslinked acrylate particles in the form of potassium salt groups as the desiccant in the adsorbent paper of Belding et al in view of Tanaka et al and further in view of Nishida ('265) as a functionally equivalent material having been disclosed for the purpose. The teachings of Nishida et al '265 along with the knowledge that polymers containing acid groups readily exchange cations (Lorah et al) provide sufficient motive to one of ordinary skill in the art to optimize the moisture absorbing properties of the paper by using in the manufacture of the paper water having no non-potassium cations or at least as few non-potassium cations or as possible, including the claimed amount, so that the maximum number of carboxyl groups in the polymer are potassium type. It would also have been obvious to obtain the claimed absorbing rate, swelling rate and thermal shrinking rate in the paper as the structure of the paper so made is substantially the same as the claimed paper.

Claims 1 and 4-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Belding et in view of Nishida (US 6080797 or US 6387970) and further in view of Nishida ('265) and as evidenced by Lorah et al.

The disclosure and deficiencies of Belding et al are used as above.

Nishida ('797) discloses particles of crosslinked acrylonitrile polymer capable of absorbing and releasing a large amount of moisture (removing moisture from air is

discussed in the background section), the particles comprising salt type carboxyl groups in an amount of 2.0-12.0 mmol/g. In some embodiments, the crosslinking of acrylonitrile groups is introduced by hydrazine and the acid salt groups are formed by hydrolysis of remaining nitrile groups by alkali metal salts. The metals used include Li, Na, K, Mg and Ca (Abs; col 1, lines 1-14; col 2, lines 19-67; col 3, lines 1 and 31-36; col 3, line 64 to col 4, line 21). In other embodiments, the polymer is copolymerized with a crosslinking monomer such as divinylbenzene that reacts with a carboxyl group (col 5, lines 26-46).

Nishida ('797) discloses making a paper by adding the polymer particles to a dispersion of pulp and synthetic fiber and manufacturing paper using a conventional paper machine. Alternatively, a slurry of polymer particles are applied to a paper (col 10, lines 37-56).

Nishida ('970) is a division of Nishida ('797), has the same disclosure.

Nishida ('797 and '970) do not disclose the claimed concentration of cations in the water used to make the paper or the coating. Nishida ('797 and '970) also do not disclose the claimed moisture absorbing rate, swelling rate and thermal shrinking rate of the paper

The disclosure of Nishida ('265) and evidence of Lorah et al are used as above.

The art of Belding et al, Nishida ('797 or '970), Nishida ('265) and the instant invention is analogous as pertaining to moisture absorbing and desorbing compositions and paper comprising the compositions. It would have been obvious to one of ordinary skill in the art to use the claimed crosslinked acrylate particles in the form of potassium

salt groups as the desiccant in the adsorbent media of Belding et al in view of Nishida ('797 or '970) and further in view of Nishida ('265) and as evidenced by Lorah et al as a functionally equivalent material having been disclosed for the purpose. The teachings of Nishida et al '265 along with the knowledge that polymers containing acid groups readily exchange cations (Lorah et al) provide sufficient motive to one of ordinary skill in the art to optimize the moisture absorbing properties of the paper by using in the manufacture of the paper water having no non-potassium cations or at least as few non-potassium cations or as possible, including the claimed amount, so that the maximum number of carboxyl groups in the polymer are potassium type. It would also have been obvious to obtain the claimed moisture absorbing rate, swelling rate, thermal shrinking rate in the paper as the structure of the paper so made is substantially the same as the claimed paper.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DENNIS CORDRAY whose telephone number is (571)272-8244. The examiner can normally be reached on M - F, 7:30 -4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on 571-272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Dennis Cordray/
Examiner, Art Unit 1791

/Eric Hug/
Primary Examiner, Art Unit 1791